

ABSTRACT: Low Energy interplanetary Transfers Using Invariant Manifolds*

Martin W. Lo **

**Jet Propulsion Laboratory
California Institute of Technology**

The invariant **manifolds** associated with the outer planets are extremely **large** objects in phase space. They are trajectories in the ecliptic which intersect one another. This enables a low energy single impulse transfer between the planets which requires **several** orbital periods. Since the periods of the outer planets are large, this time factor precludes its use in mission design. However, if we consider the Jovian satellites where the same dynamics occurs but with very short orbital periods, this approach may be used for tour design requiring **minimal ΔV** . The existence of this transfer is an indication of the instability of the region of space between the satellites. It may explain some of the difficulties encountered in traditional **satellite** tour designs using conic approximations.

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•* Member of Technical Staff, **Launch** and Earth Orbit **Mission** Analysis Group, Navigation and Flight Mechanics Section